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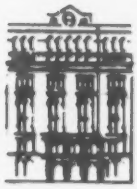
The Cooper Union
1989 *National Survey of*

UNDERGRADUATE WOMEN ENGINEERING STUDENTS



The Albert Nerken
School of Engineering
Dr. Eleanor Baum, Dean
The Cooper Union
for the Advancement of Science and Art
New York City

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THE COOPER UNION NATIONAL SURVEY
OF UNDERGRADUATE WOMEN ENGINEERING STUDENTS

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METHODOLOGY

The Cooper Union Survey of Undergraduate Female Engineering Students was developed and conducted by The Cooper Union for the Advancement of Science and Art, New York, by Dr. Eleanor Baum, dean, of the college's Albert Nerken School of Engineering, with Lynn Appelbaum, director of public affairs.

Consultation on the questionnaire design and survey methodology was provided by Research & Forecasts, Inc., New York.

The Survey of Undergraduate Female Engineering Students was conducted through the mail, with 4,000 surveys randomly distributed nationwide to student members of the Society of Women Engineers (SWE) on April 17, 1989.

Completed questionnaires were returned to Cooper Union's Office of Public Affairs by the cutoff date of May 5, and were included in the data analysis that formed the basis of this report.

The return rate of 1,945 surveys (48.6%) is unusually high for a mail questionnaire.

Data tabulation and analysis was provided by Microtab, Inc., Atlanta, Georgia.

This was one of two surveys taken simultaneously--the other survey polled working women engineers.

DEMOGRAPHICS OF THE STUDENT ENGINEER

The sampling represented students in all four years of undergraduate engineering programs. (26% first year; 25% second year; 24% third year and 25% fourth year.)

Ages ranged from under 18 (10%), 19 (20%),20 (21%), 21 (19%) 22 (12%), and ages 23-29 (14%). Four percent were age 30 or over.

95% were U.S. citizens. 81% were Caucasian, 9 % Asian, 3% African-American and 3% Hispanic.

92% of the respondents were single, 6% married, and 2% separated or divorced.

74% were members of other technical societies, such as ASME (American Society of Mechanical Engineers and IEEE (Institute of Electrical and Electronic Engineers).

22% listed electrical engineering as their major area of specialization; 17% for mechanical; 12% chemical; 12% industrial; 10% civil, 5% computer,5% aerospace and 4% biomedical.

40% have a family member who is or was an engineer: father 26%: brother 10%, sister 3%, and mother 1%.

CAREER EXPECTATIONS

Respondents' primary motivations for pursuing a career in engineering were their expectations to do interesting work (69%), the challenge of solving problems (53%), and expectations of many employment opportunities (50%). On the low end of the scale was the desire to meet men (3%).

79% indicated that they were not considering a career as an engineering faculty member. Only 6% strongly agreed that they were considering careers in academia.

Respondents were asked to evaluate the most important factors in accepting a first job. In order of importance were the opportunity to do interesting work (98%); opportunities for advancement (96%) colleagues at work; (95%); first impressions of organization at interview (91%) organization location (86%); training program (86%) ethical considerations about type of work (76%), tuition remission for graduate studies (33%)

Of little importance was job title, the number of women engineers in the organization and the size of the organization.

65% expected to be in a supervisory position within five years of graduation.

When asked about their perceptions of being a women engineer, 98% of the respondents said that they felt an engineering career would offer them opportunities to learn and grow. 75% expressed concern about having to prove themselves as a competent engineer. 62% of them expressed concern about staying up to date technically.

ENGINEERING EDUCATION

Overwhelmingly, 93% were pleased with their decision to study engineering (63% strongly agreed). Only 3% strongly agreed that they'd like to change majors (8% agreed somewhat)

Respondents described multiple means for funding their educations: 73% through their family; 61% summer jobs; 50% scholarship, 44% part-time work during school; 37% personal savings, 36% loans, and 25% government or state aid.

60% plan to get a masters degree in engineering and 45% want an advanced degree in another field. Just over one fifth are planning to earn their Ph.Ds. in engineering (with only 7% expressing strong motivation.)

35% had tutored or had other teaching experience while in college and almost a third had participated in a program to encourage high school girls to consider studying engineering.

46% took summer job or an internship in engineering, and of those, 81% said it motivated them positively in their choice to pursue engineering as a career.

Respondents indicated that support for them to study engineering varied greatly.

Support For Women Engineering Students

Students found the highest support from female engineering students (77%) and college friends (71%). 61% said that male engineering students were supportive (5% were discouraging).

Of the environment in their undergraduate engineering school, 42% described the environment as very supportive toward women in engineering programs, and 45% described it as somewhat supportive. Only 1% described the environment as not at all supportive.

Only 18% strongly agreed that there was a sympathetic engineering faculty member with whom they could talk to about a school problem. 36% strongly disagreed that there was a sympathetic engineering faculty member with whom they could talk about a problem. However, 90% said they could seek their teacher's assistance for help with school work outside class.

Just over half said their college math and science professors were supportive of their studying engineering, while 60% of their engineering professors were supportive (34% neutral). Only 4% said their math, science and engineering professors were discouraging.

Classroom Experience

About their engineering classroom experience, 88% felt their engineering classes were interesting and very difficult. 70% felt that the faculty were good teachers, but only half of the respondents felt their teachers had excellent communications skills.

60% described the engineering curriculum as more difficult than they expected it to be, with 18% agreeing strongly.

43% said that in lab groups they were generally the one to record the data, 12% strongly agreeing.

PERSONAL PROFILE

Women engineering students expressed a high level of family supportiveness for them to pursue their engineering studies: 76% described their mothers as supportive; 77% of fathers. 66% said they had other family members were supportive of their studying engineering.

80% saw themselves as leaders. 77% felt they were assertive, and 61% said that they had always been confident, although over half felt they are shy. Half said that, as children, they were "tomboys."

69% had always thought of themselves as physically attractive and 94% said that being an engineering students did not decrease their femininity.

85% of the respondents envisioned becoming mothers.

College Academic and Extra Curricular Experience

67% described themselves as outstanding overall students. 74% said they enjoyed liberal arts courses and 71% said they enjoyed laboratory classes. Nearly a third participated in college sports. 90% had lots of male friends and 69% had many female friends.

In extracurricular college activities, 43% were officers of a student professional organization; 17% were in sororities, 10% were active in student government, 2% worked on a newspaper staff.

High School Academic and Extracurricular Experience

About their high school academic experience, 94% considered themselves outstanding overall students. While 96% excelled in math; 81% in physics, 86% in chemistry, 85% excelled in English. 82% enjoyed laboratory classes. 78% said they enjoyed fixing and building things.

Support from guidance counsellors to pursue a career in engineering was lacking. Only 43% described their high school guidance counselors as supportive of their decision to study engineering. 45% were neutral and 9% were actually discouraging. 62% described high school teachers as supportive (31% were neutral, 4% discouraging).

In high school, 74% said they were popular, with 78% having many male friends. 50% were active in sports; 51% were officers in student organizations, 45% studied a musical instrument, 30% were active in student government, 28% were members of newspaper or yearbook staffs and 16% were cheerleaders or twirlers.

GENDER ISSUES AND HARASSMENT

In the College Classroom

Only 6% felt that faculty made themselves less available to them for questions and help than to male students. Less than a quarter felt uncomfortable approaching male professors for help.

88% felt they were graded as fairly as male students. However, nearly half felt uncomfortable asking questions in class. More than a third of the women felt they intimidated the male students in their classes. However, less than one fifth felt left out of social activities.

78% said that they have few female role models (38% strongly agreed) and 80% said they wished they had more faculty female role models.

Perceptions about Gender Issues in the Workplace

Although women students were enthusiastic about their career choice, one third expressed concern about sexual harassment on the job. Just over a fifth of the students felt that it would be harder to get jobs as a woman.

More than half expressed concern over how male engineers would interact with them on the job. Nearly three quarters were concerned about how males would react to them as female supervisors.

Interestingly, 35% agreed that they were uncomfortable about being evaluated on the job by female supervisors, who might be worried about competition from them. Whereas, only 21% were uncomfortable about being evaluated in the future by male supervisors.

Social Perceptions

67% agreed that as female engineering students, they intimidated people whom they met socially (22% agreed strongly). However, only 24% felt that other people perceive them as less feminine because they were engineering students. 52% strongly disagreed with this statement.

CONCLUSIONS

The survey indicates that women who chose to study engineering are highly satisfied with their decision. Findings indicate that women engineering students are achievement-oriented females. They perceive themselves as leaders, assertive, confident and popular. Many were active in sports, student government and organizations and had a hobby, such as music. Many continue extra curricular activities in college.

Women engineering students are motivated to pursue engineering as a profession for several main reasons: They felt that the field will give them the opportunity to grow professionally , to do interesting work, to solve problems and to have a variety of employment options.

About 65% expected to be in supervisory positions within 5 years. Most are interested in the areas of electrical and mechanical engineering.

Only 6% indicated a strong interest to pursue an academic engineering profession. This continues to be problematic since most women engineers have few female role models, but expressed a strong wish for female mentors. If women continue to shy away from academia, the problem will perpetuate itself.

In accepting a first job, respondents list the most important considerations as the opportunity to do interesting work and for professional advancement, compatibility with their work place colleagues, first impressions of the company and location of the organization. A large percentage agree that ethical considerations will be an important factors in their job decisions.

In high school, they were outstanding students overall, excelling in English, as well as math, physics and chemistry.

The survey indicates a high level of supportiveness to study engineering from family members and friends. (Many had family members who were engineers).

However, strong support appears deficient from guidance counselors and high school teachers. This signals a need to improve the image of the engineering profession and to better communicate to these groups and to the public the positive aspects of the engineering profession for women, as well as men.

As a group, female engineering students do not believe that being an engineering student decreases the femininity and most perceive themselves as physically attractive. They do, however, experience other people as being threatened by their being a female engineer.

Female engineering students believe that they are graded as fairly as male students. Many women assumed the role of "recording data" in laboratory work. Female students perceive male students as being intimidated by them.

Many express concerns about gender issues in the workplace. A third expressed concern about sexual harassment in the workplace. More than half are concerned about interacting with males on the job, although only one fifth are concerned about being evaluated by male supervisors.

THOUGHTS FROM DR. ELEANOR BAUM,
DEAN, THE ALBERT NERKEN SCHOOL OF ENGINEERING OF THE COOPER UNION

There is a clear need to inform young women about the rewards and opportunities of the engineering profession. The survey results reveal a high level of satisfaction young women feel about their chosen course of study, despite gender issues.

The survey found that a high percentage of engineering students had a family member in the profession. This indicates that if young women understand what engineers do, there is a greater likelihood they will pursue this career path. Therefore, we must go beyond the profession to educate the public at large about engineering.

The first responsibility lies with the engineering schools and with the profession, itself. Each must become more involved in outreach programs in local communities to encourage young people, especially young women, to study engineering.

On a more direct level, we must educate high school guidance counselors, who were described in this survey and by working women as being less than supportive of young women interested in the profession. First, this means developing better recruitment materials for counselors, themselves, to understand that engineering is an excellent career for women. Second, this will require better recruitment information to help students understand what engineers do and what the rewards of the profession are.

In addition, it is imperative that we educate high school math and science teachers about the rewards of the engineering profession, to encourage both male and female students to consider engineering careers.

The survey results showed overwhelmingly that female engineering students are leaders, outstanding students, confident and assertive. While this is heartening news for the profession, it is, at the same time, disheartening that the profession mainly attracts exceptional female students. Therefore, we need to help young women understand that even if they are average students who enjoy math and science, engineering still can be a viable career choice, just as it is for average male students.

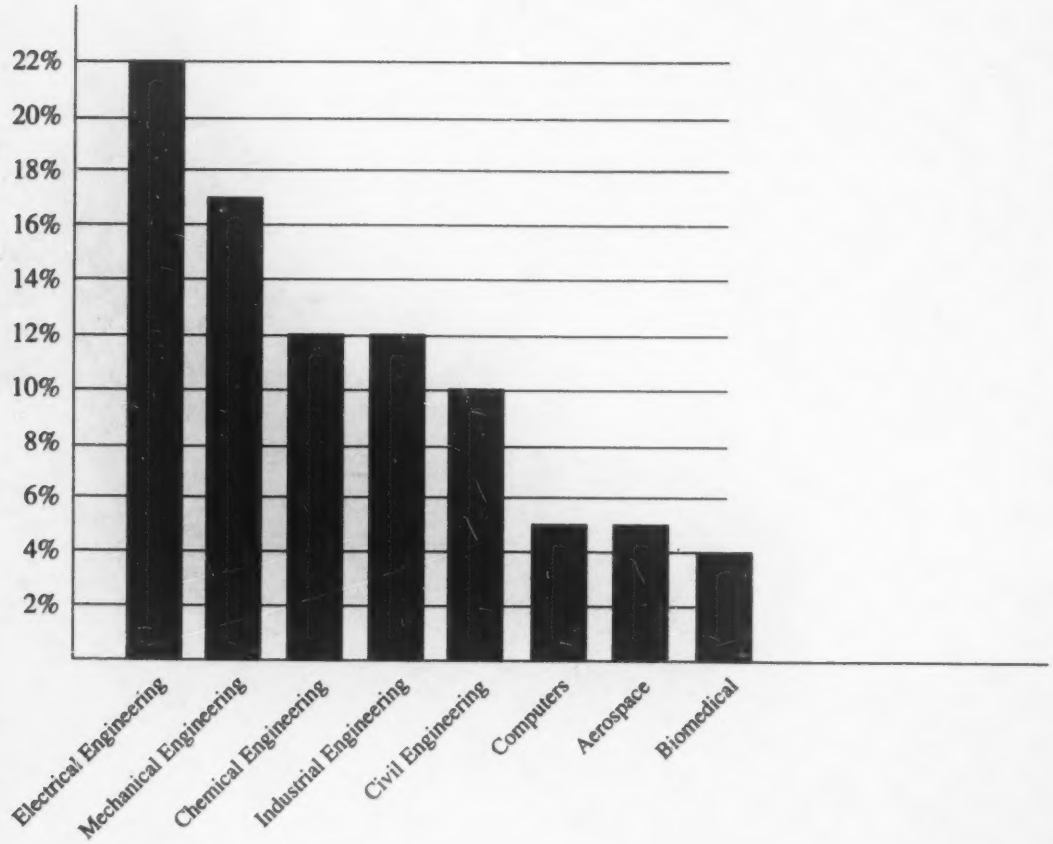
If we are to attract young women to the field, it is crucial that we provide female engineering role models. Female faculty members at colleges, in particular, send a positive message to young women about the profession. Campus SWE chapters also play a crucial role in supporting women engineering students. In addition, we need to encourage women engineers in industry to serve as role models for both male and female college engineering students.

It is clear that extra support from faculty and administration for women engineering students is required. Faculty must show greater sensitivity to female students and minority students, who may have different needs from traditional male engineering students. In addition, colleges should create special programs for women engineering students, including orientation programs, which are adequately staffed and funded. These already have proven successful in many institutions.

The survey revealed that engineering students range from their late teens into their early thirties. This indicates that there are untapped resources in non-traditional students--transfer students from two-year colleges, women who have left the work force to raise a family, and professional women from other fields who want to become engineers. The country faces an escalating need to draw from its full pool of human resources. Women and minorities will play an increasingly critical role in helping the nation maintain its competitive edge in the world market.

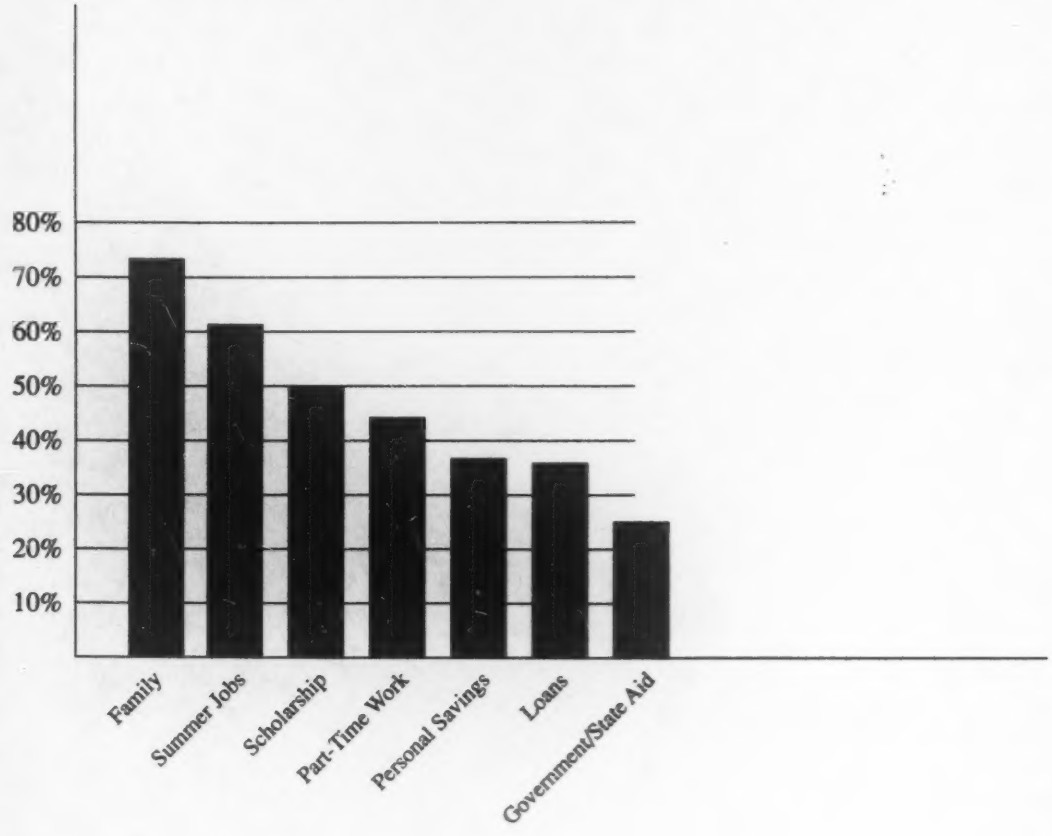
Undergraduate Female Engineers

Area of Specialization



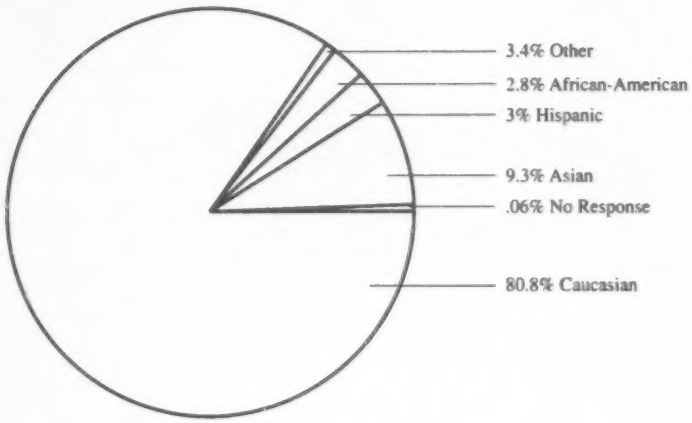
Undergraduate Female Engineers

Financing Education

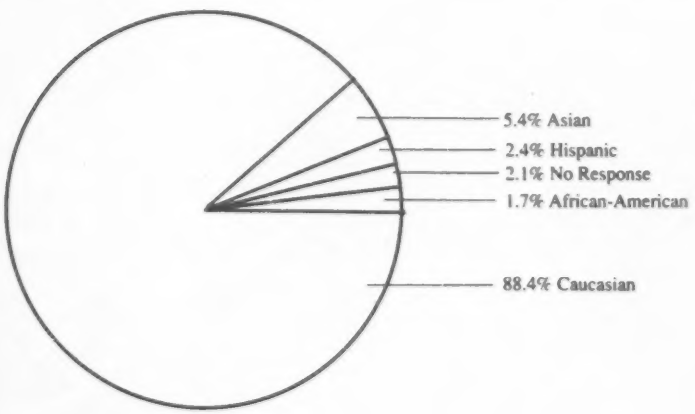


Ethnicity

Undergraduate Female Engineers

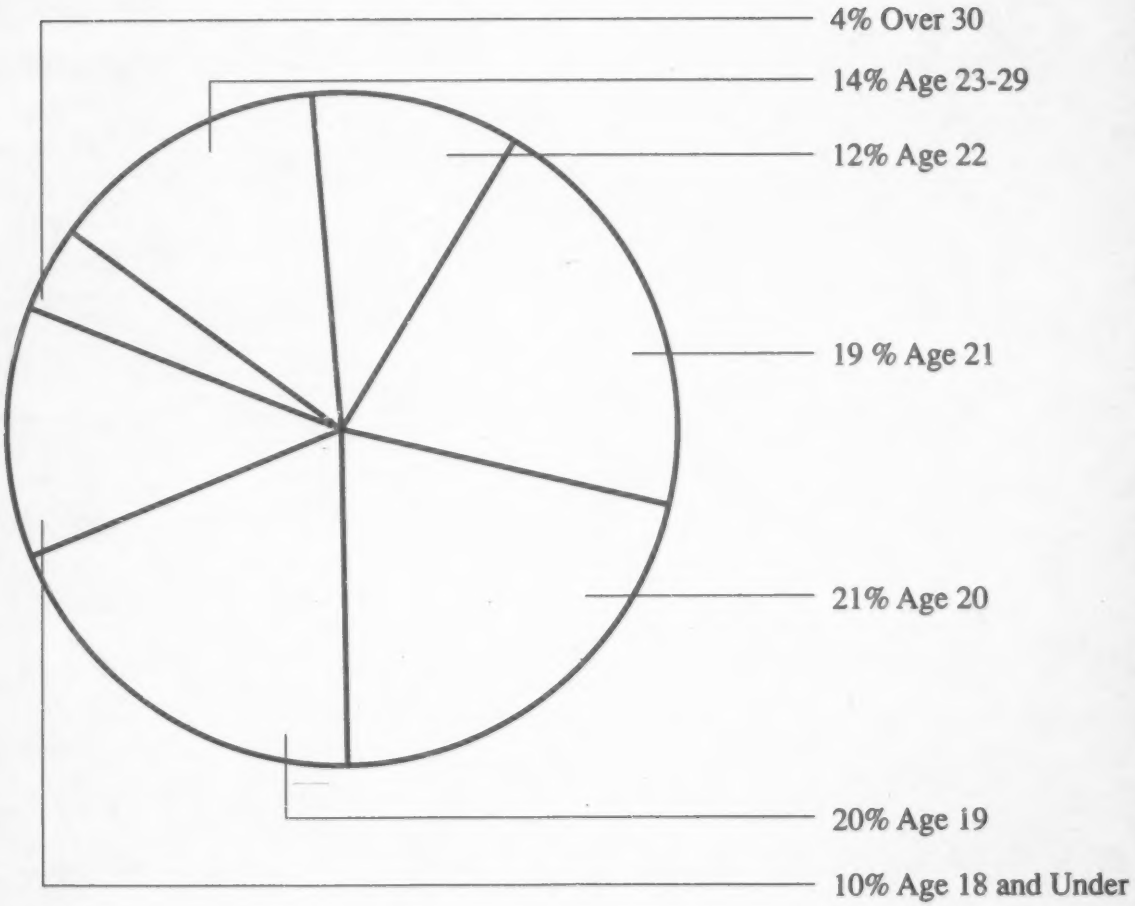


Working Women Engineers



Undergraduate Female Engineers

Age



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Cooper Union Women Engineering Student Survey

THIS FIRST GROUP OF QUESTIONS ARE FACTUAL, ABOUT YOU AND ABOUT YOUR EXPERIENCE IN ENGINEERING. LATER QUESTIONS PROBE YOUR ATTITUDES ABOUT THE FIELD.

Resp # - (1-4)
Card 1 (5)

1. Your citizenship USA [ ] 1 Other [ ] 2 (6)

2. Your marital status
   Currently married [ ] 1 Separated/Divorced [ ] 3 (7)
   Single [ ] 2 Widowed [ ] 4

3. If you do not have children, do you envision having children in the future?
   Yes [ ] 1 No [ ] 2 (8)

4. Would you describe yourself as:
   Caucasian [ ] 1 Hispanic [ ] 4
   African-American [ ] 2 Oriental [ ] 5
   Other [ ] 3 [Please specify] _____ (9)

5. List the first three digits of your home mail zip code _____ (10-12)

6. Your age_____ (13-14)

7. Are you a member of other technical societies such as ASME, IEEE?
   Yes [ ] 1 No [ ] 2 (15)
   If yes, specify _____ (16)

8. What are the sources of payment for your engineering education?
   Family [ ] 1 Your own part-time work
   Government/state aid [ ] 2 while in school [ ] 5
   Loans [ ] 3 Personal savings [ ] 6
   Scholarship [ ] 4 Summer jobs [ ] 7 (17)

9. Have you had an engineering internship or summer job, (including coop jobs?)
   Yes [ ] 1 No [ ] 2 (18)

10. Did this summer job or internship positively motivate you in your choice of an engineering career?
    Yes [ ] 1 No [ ] 2 (19)

11. Anticipated year of your Bachelor's Degree graduation: 19____ (20-21)

12. What is/will be your area of specialization in college? (22-23)

Aerospace engineering	[ ] 01	Manufacturing engineering	[ ] 11
Agricultural engineering	[ ] 02	Mechanical engineering	[ ] 12
Architectural engineering	[ ] 03	Metallurgical engineering	[ ] 13
Biomedical engineering	[ ] 04	Mining engineering	[ ] 14
Chemical engineering	[ ] 05	Naval arch/marine engineering	[ ] 15
Civil engineering	[ ] 06	Nuclear engineering	[ ] 16
Computer engineering	[ ] 07	Petroleum engineering	[ ] 17
Electrical engineering	[ ] 08	Systems engineering	[ ] 18
Engineering science	[ ] 09	Tele-communications	[ ] 19
Industrial engineering	[ ] 10	Other [please specify]	[ ]20_____

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13. What are your plans upon graduation?

_____ (24-25)

14. Other degrees anticipated?

_____ (26-27)

15. How important do you think the following factors will be in the acceptance of your first job?

	Very important 1	Somewhat important 2	Somewhat important 3	Not at All important 4	
Salary	[ ]	[ ]	[ ]	[ ]	(28)
Location of organization	[ ]	[ ]	[ ]	[ ]	(29)
Proximity of organization to family	[ ]	[ ]	[ ]	[ ]	(30)
Size of organization	[ ]	[ ]	[ ]	[ ]	(31)
Impressions of organization during plant interview	[ ]	[ ]	[ ]	[ ]	(32)
The people you will work with	[ ]	[ ]	[ ]	[ ]	(33)
Opportunity to do interesting work	[ ]	[ ]	[ ]	[ ]	(34)
Benefits	[ ]	[ ]	[ ]	[ ]	(35)
Pension plan	[ ]	[ ]	[ ]	[ ]	(36)
Child-care policies and programs	[ ]	[ ]	[ ]	[ ]	(37)
Prestige of your job title	[ ]	[ ]	[ ]	[ ]	(38)
Prestige of organization	[ ]	[ ]	[ ]	[ ]	(39)
Tuition remission programs for graduate studies	[ ]	[ ]	[ ]	[ ]	(40)
Organization's training program	[ ]	[ ]	[ ]	[ ]	(41)
Perceived opportunities for advancement	[ ]	[ ]	[ ]	[ ]	(42)
Number of women engineers in the organization	[ ]	[ ]	[ ]	[ ]	(43)
Ethical considerations about the type of work	[ ]	[ ]	[ ]	[ ]	(44)
Other [specify]	[ ]	[ ]	[ ]	[ ]	(45)

_____ (46)

16. Do you expect to gain a supervisory position within five years of graduation?
Yes [ ]1 No [ ]2 (47)

17. Do you have a family member who is/was an engineer
Mother [ ]1 Father [ ]3 Other (specify _____ 5 (48)
Brother [ ]2 Sister [ ]4

18. Overall, how supportive is your undergraduate engineering school towards women in engineering?
Very supportive [ ]1 Not very supportive [ ]3
Somewhat supportive [ ]2 Not at all supportive[ ]4 (49)

Continue to the next page

19. In your experience, which of the following are/were strongly supportive, neutral or discouraging towards your studying engineering?

	Supportive 1	Neutral 2	Discouraging 3	
Your mother	[ ]	[ ]	[ ]	(50)
Your father	[ ]	[ ]	[ ]	(51)
Other family members	[ ]	[ ]	[ ]	(52)
Friends of your family	[ ]	[ ]	[ ]	(53)
High school teachers	[ ]	[ ]	[ ]	(54)
High school guidance counselors	[ ]	[ ]	[ ]	(55)
Your high school friends	[ ]	[ ]	[ ]	(56)
College math and science professors	[ ]	[ ]	[ ]	(57)
College engineering professors	[ ]	[ ]	[ ]	(58)
Fellow male engineering students	[ ]	[ ]	[ ]	(59)
Fellow female engineering students	[ ]	[ ]	[ ]	(60)
Your college friends	[ ]	[ ]	[ ]	(61)
Other specify	[ ]	[ ]	[ ]	(62)
_____				(63)

20. As a female engineering student, do you agree or disagree with the following statements?

	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
I feel I have to work harder than male engineering students to get comparable grades	[ ]	[ ]	[ ]	[ ]	(64)
I sometimes am subjected to harassment by male engineering students because I am a female	[ ]	[ ]	[ ]	[ ]	(65)
I am sometimes subjected to harassment by engineering faculty because I am a female	[ ]	[ ]	[ ]	[ ]	(66)

Continue to the next page

	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
The engineering curriculum is more difficult than I expected it to be	[ ]	[ ]	[ ]	[ ]	(67)
In lab groups I am generally the one to record the data	[ ]	[ ]	[ ]	[ ]	(68)
I feel that I intimidate the male students in my classes	[ ]	[ ]	[ ]	[ ]	(69)
I feel that faculty make themselves less available to me for questions and help than they do for male students	[ ]	[ ]	[ ]	[ ]	(70)
I feel left out of a lot of the social activities in the engineering school	[ ]	[ ]	[ ]	[ ]	(71)
I feel that I am graded as fairly as the males in my classes	[ ]	[ ]	[ ]	[ ]	(72)
I am uncomfortable asking questions in class	[ ]	[ ]	[ ]	[ ]	(73)
I am uncomfortable approaching male professors for help	[ ]	[ ]	[ ]	[ ]	(74)

(Z 75-80)
Resp # – (1-4)
Card 2 (5)

21. To what degree do you agree with the following statements about your high school experience?

	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
I excelled in high school math	[ ]	[ ]	[ ]	[ ]	(6)
I excelled in high school physics	[ ]	[ ]	[ ]	[ ]	(7)
I excelled in high school chemistry	[ ]	[ ]	[ ]	[ ]	(8)
I excelled in high school English	[ ]	[ ]	[ ]	[ ]	(9)
I enjoyed laboratory classes	[ ]	[ ]	[ ]	[ ]	(10)

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	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
I enjoyed fixing and building things	[ ]	[ ]	[ ]	[ ]	(11)
I was an outstanding student overall	[ ]	[ ]	[ ]	[ ]	(12)
I was popular	[ ]	[ ]	[ ]	[ ]	(13)
I had lots of male friends	[ ]	[ ]	[ ]	[ ]	(14)

22. When you were in high school were you: (Check all that apply)

A cheerleader or twirler	[ ] 1	An officer of a student organization	[ ] 4	
Active in sports	[ ] 2	On the high school newspaper		
Active in student government	[ ] 3	or yearbook staff	[ ] 5	
		Studying a musical instrument	[ ] 6	(15)

23. To what degree do you agree with the following statements about your college experience?

	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
I enjoy laboratory classes	[ ]	[ ]	[ ]	[ ]	(16)
I participate in college sports	[ ]	[ ]	[ ]	[ ]	(17)
I am an outstanding student overall	[ ]	[ ]	[ ]	[ ]	(18)
I have lots of female friends	[ ]	[ ]	[ ]	[ ]	(19)
I have lots of male friends	[ ]	[ ]	[ ]	[ ]	(20)
I enjoy liberal arts courses	[ ]	[ ]	[ ]	[ ]	(21)

24. Are you currently: (Check all that apply)

A cheerleader or twirler	[ ] 1	A member of a sorority	[ ] 4	
Active in student government	[ ] 2	On the college newspaper staff	[ ] 5	
An officer of a student professional organization	[ ] 3			(22)

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25. Which of the following statements about yourself best describe why you chose to study engineering? [Choose no more than 3]

I expect a good potential salary	[ ] 01	
I expect to do interesting work	[ ] 02	
I expect opportunities to solve societal problems	[ ] 03	
I want to meet men	[ ] 04	
I expect many job opportunities	[ ] 05	
I want the challenge of solving problems	[ ] 06	
I want a career which does not require graduate study	[ ] 07	
I want a career where I do not have to deal with people	[ ] 08	
I want a career where written and oral skills are important	[ ] 09	
I want to study the hardest possible undergraduate major to prove I could do it	[ ] 10	
I want a profession that is transferable throughout the world	[ ] 11	
I want to make a statement about being really different from other women	[ ] 12	
Other [specify]	[ ] 13	(23-24)
_____		(25-26)

26. Most of the time I study with:

Male students	[ ] 1	Both male and female students	[ ] 3	
Female students	[ ] 2	Alone	[ ] 4	(27)

27. As a woman engineering student, do you agree or disagree with the following statements

	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
I feel that an engineering career will offer me opportunities to learn and grow	[ ]	[ ]	[ ]	[ ]	(28)
I feel that it will be harder for me to get jobs because I am a woman	[ ]	[ ]	[ ]	[ ]	(29)
I worry about how male engineers will interact with me on the job	[ ]	[ ]	[ ]	[ ]	(30)
I am concerned about how males will react when I have to supervise them	[ ]	[ ]	[ ]	[ ]	(31)

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	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
I worry about being made to feel like an outsider in my job	[ ]	[ ]	[ ]	[ ]	(32)
I am concerned about having to prove myself as a competent engineer	[ ]	[ ]	[ ]	[ ]	(33)
I wonder how I will stay technically up to date	[ ]	[ ]	[ ]	[ ]	(34)
I worry about sexual harassment on the job	[ ]	[ ]	[ ]	[ ]	(35)
I am uncomfortable about being evaluated in the future by male supervisors	[ ]	[ ]	[ ]	[ ]	(36)
I am uncomfortable about being evaluated in the future by female supervisors who may be worried about competition from me	[ ]	[ ]	[ ]	[ ]	(37)

28. As a female engineering student, to what extent do you agree with the following statements about engineering?

	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
Most of my engineering classes are interesting	[ ]	[ ]	[ ]	[ ]	(38)
Most of my engineering classes are very difficult	[ ]	[ ]	[ ]	[ ]	(39)
Most of the faculty are good teachers	[ ]	[ ]	[ ]	[ ]	(40)
Most of my teachers have excellent communications skills	[ ]	[ ]	[ ]	[ ]	(41)
I can see my teachers outside of class to ask questions	[ ]	[ ]	[ ]	[ ]	(42)

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	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
I have few female role models	[ ]	[ ]	[ ]	[ ]	(43)
I wish I had more female role models on the faculty	[ ]	[ ]	[ ]	[ ]	(44)
I am considering a career as an engineering faculty member	[ ]	[ ]	[ ]	[ ]	(45)
I plan to get a Master's Degree in engineering	[ ]	[ ]	[ ]	[ ]	(46)
I plan to get an advanced degree in another field [specify]_____	[ ]	[ ]	[ ]	[ ]	(47)
I plan to get my doctorate in engineering	[ ]	[ ]	[ ]	[ ]	(48)
I would like to change majors out of engineering (If so, specify to what area)_____	[ ]	[ ]	[ ]	[ ]	(49)
I feel alone and isolated much of the time at school because I am female engineering student	[ ]	[ ]	[ ]	[ ]	(50)
I feel that other people perceive me as less feminine because I am an engineering student	[ ]	[ ]	[ ]	[ ]	(51)
There is a sympathetic engineering faculty member whom I can see when I feel upset about a school matter	[ ]	[ ]	[ ]	[ ]	(52)
I am pleased with my decision to study engineering	[ ]	[ ]	[ ]	[ ]	(53)
As a female engineering student, I feel that my field of study intimidates people whom I meet socially	[ ]	[ ]	[ ]	[ ]	(54)

29. Have you done tutoring or had another teaching experience while in college?
Yes [ ] 1 No [ ] 2 (55)

Continue to the next page

30. Have you participated in high school outreach programs to encourage girls to consider studying engineering?
Yes [ ]1 No [ ]2 (56)

31. To what extent do you agree that the following statements apply to you?

	Strongly Agree 1	Somewhat Agree 2	Somewhat Disagree 3	Strongly Disagree 4	
I was a "tomboy"	[ ]	[ ]	[ ]	[ ]	(57)
I have always been confident	[ ]	[ ]	[ ]	[ ]	(58)
I am a shy person	[ ]	[ ]	[ ]	[ ]	(59)
I have always thought of myself as a physically attractive person	[ ]	[ ]	[ ]	[ ]	(60)
Being an engineering student does not decrease my femininity	[ ]	[ ]	[ ]	[ ]	(61)
I have more female friends than male friends	[ ]	[ ]	[ ]	[ ]	(62)
I am an assertive person	[ ]	[ ]	[ ]	[ ]	(63)
I am a leader	[ ]	[ ]	[ ]	[ ]	(64)

Additional comments:_____ (65)

This concludes the survey. Thank you.

THE ALBERT NERKEN SCHOOL OF ENGINEERING
The Cooper Union for the Advancement of Science and Art

The Albert Nerken School of Engineering--one of the nation's oldest and most distinguished engineering schools--has educated thousands of engineers, many of them leaders in their fields.

For 131 years, the School of Engineering--like Cooper Union's Schools of Art and Architecture--has provided a private, tuition-free education to every student, based solely on talent.

Unlike many other engineering schools, Cooper Union immerses its students in the solution of real-world engineering problems, using America's biggest city, New York, as its urban "laboratory."

Cooper Union students--and alumni--are second to none in the nation. Inventor Thomas Edison was a Cooper Union engineering student, as was Felix Frankfurter, a former associate justice of the U.S. Supreme Court. From the School of Engineering have come such distinguished engineers and leaders as Emile Berliner, who created the forerunner of modern phonograph records; Joshua Lionel Cowen, inventor of Lionel toy trains; William Deasy, president and chief operations officer of Morrison-Knudsen Corp.; Isidor Fankuchen, an expert in x-rays; George A. Fox, president of Grow Tunneling Corp. (and chairman of the Cooper Union Board of Trustees); and Alvin M. Marks, a leading researcher in advanced solar power projects. Cooper Union engineering graduates have risen to top leadership roles at such companies as Consolidated Edison, Crown Zellerbach, Raytheon, Diebold Corporation and Comsat.

Peter Cooper, an immigrant's son with less than a year of formal schooling, originally intended the science classes for the "improvement" of mechanics and their apprentices. (The humble Cooper, even after becoming one of America's most successful inventors and industrialists, continued to describe himself as merely "a mechanic of New York.")

When The Cooper Union opened the doors of its new brownstone building in November of 1859, hundreds of New Yorkers eagerly signed up to take free night science courses. This marked the birth of one of the boldest experiments in American history--free-tuition education for the working class and for women.

Today, the School of Engineering remains distinctive. Its dean, Dr. Eleanor Baum, is the only woman to head an American engineering school. While dedicated to maintaining the highest standards in engineering education, Dr. Baum also actively promotes her profession to minority and women students.

When Peter Cooper founded his college, he wanted to give young people the one privilege he lacked--a good education. He also wanted to make possible the development of talent that otherwise would have gone undiscovered. As Cooper Union looks to the next century, it remains true to Peter Cooper's ideals--to provide an education "equal to the best."

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